

REMARKS

Claims 1-13 are pending in this application. Claim 4 is indicated by the Examiner as containing allowable subject matter. Claim 1 is amended as suggested by the Examiner on page 3 of the Office Action of January 30, 2004. No new matter is added. Support for the amendment to the claims is found at page 13, lines 23-25 of the specification.

Page 2 of the Office Action of January 30, 2004 states that claims 1-5 and 6-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,294,519 to Mori or European patent application EP 0178864 A2. However, applicant notes that on page 4 of the Office Action the Examiner states that claim 4 is allowed. Accordingly, applicants are responding for the purposes of this Office Action with the belief that claim 4 is allowed and that the Examiner did not intend to include claim 4 in the 35 U.S.C. 103(a) rejection on page 2 of the Office Action.

In view of the above, applicant submits the following remarks regarding the patentability of the claims.

The Invention

The subject matter of the present invention relates to a method of forming a conductive pattern on dielectric substrates covered with a metal film, preferably a layer of copper.

As set forth in claim 1 the method comprises the following different steps:

a) a substrate covered with a metal film is coated with a protective layer which is formed by treating the metal film with a solution containing at least one compound containing nitrogen,

b) the protective layer is stripped (ablated) away by ultraviolet (UV) radiation at least partially in the regions not corresponding to the conductive pattern to be formed, the protective layer being exhausted into a gas phase, in such a way that the metal film is exposed, and

c) the exposed metal film is removed by etching.

The claimed method is directed to a process of producing a protective layer on a metal film on a substrate and generating a pattern therein by stripping the layer away by means of UV radiation. The UV radiation directly causes the stripping away of the protective layer in the claimed method. In contrast to other methods of forming a conductive pattern on substrates, the stripping away of the protective layer by UV radiation is not caused in whole or in part by means of a developing solution which is normally used in a photoresist technique. Simply stated, in the method of the present invention the protective layer is removed in those regions which have been exposed to UV radiation.

For the reasons set forth below, it is respectfully submitted that the claimed method is novel and nonobvious over any of the cited prior art methods of forming a conductive pattern on dielectric substrates.

35 U.S.C. 103 Rejection of Claims 1-3 and 5-13 over Mori

Claims 1-3 and 5-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,294,519 to Mori. Applicant hereby respectfully traverses the rejection. The Mori reference is directed to a process of making a printed circuit board in which a corrosion prevention treatment layer is coated onto a copper-clad base plate prior to the base plate receiving a photosensitive electrodeposition coating. The photosensitive

photoresist is then exposed to light and developed to form a pattern which is then used as an etching mask for the copper plate.

In stark contrast to the present invention, the method described in Mori is directed to a process which does not involve stripping of the protective layer on the copper base plate such that the protective layer is exhausted into the gas phase. As described above, the Mori reference involves exposing the photoresist to light through a pattern and then developing the photoresist to light. Therefore, U.S. Patent 5,294,519 to Mori teaches an entirely different process from the present claimed invention.

In paragraph 2 on page 2 of the Office Action, it is stated that Mori teaches that a corrosion treatment layer is placed on the cladding prior to the placement of the photoresist layer. If the Examiner is interpreting the corrosion treatment layer of Mori to be equivalent to the presently claimed protective layer, then applicants submit that the corrosion treatment layer of Mori cannot be equated with applicant's protective layer because Mori's layer is not stripped away by ultraviolet light at least partially and exhausted into the gas phase. It is also submitted that Mori teaches away from the present claimed invention since the corrosion prevention treatment layer taught therein could not possibly serve as an etching resist layer.

In addition, it is respectfully submitted that the Mori reference does not contain any teaching, suggestion or motivation which would lead one of ordinary skill in the art to arrive at the present invention.

Accordingly, applicants hereby respectfully request withdrawal of the 35 U.S.C. 103(a) obviousness rejection of the claims over U.S. Patent 5,294,519 to Mori.

35 U.S.C. 103 Rejection of Claims 1-3 and 5-13 over EP 0178864A2

Claims 1-3 and 5-13 are rejected under 35 U.S.C. 103(a) as being obvious over European patent application EP 0178864 A2. Applicant hereby respectfully traverses the rejection.

EP 0178864 discloses a method for producing a copper through-hole printed circuit board, which comprises forming a desired pattern on a copper-clad laminated plate by screen printing using a resist ink with a negative image soluble in an alkaline aqueous solution. Then the copper-clad laminated plate is immersed in an aqueous solution of an alkylimidazole salt to form on the copper surface of the plate an etching resist film, composed of the alkylimidazole compound. This is followed by drying the resulting plate and then treating it with an alkaline etching solution. At the end of the process the alkylimidazole coating is dissolved and removed.

It is submitted that EP 0178864 is directed to a process which is entirely different from the claimed process of the present invention. The reference is not even directed to a photoresist coating on a substrate, but rather concerns a resist ink printed on a circuit board which is then coated with a alkylimidazole coating. In stark contrast, the present claimed invention includes producing a protective layer on a metal film on a circuit board substrate and generating a pattern by stripping away of at least a portion of the protective layer by means of UV radiation such that the protective layer is exhausted into the gas phase. The above description emphasizes the extent to which the claimed process and the method of EP 0178864 are different as direct stripping of the protective layer from the metal film is not taught or suggested in the reference nor is there any motivation to arrive at the present invention based on the teachings therein. Accordingly, reconsideration of the 35 U.S.C. 103(a) rejections of the claims is requested.

In response to the Examiner's comments on page 4 of the Office Action of January 30, 2004 that the feature that at least portions of the protective layer are exhausted into the gas phase was not present in the claims, applicant has amended the claims to include the feature. Claim 1 has been amended as suggested by the Examiner to include that feature and it is submitted that the claims are now in condition for allowance.

Therefore, applicants respectfully request reconsideration of the 35 U.S.C. 103(a) obviousness rejections on the grounds that it would not have been obvious to one of ordinary skill in the art at the time of the invention was made to arrive at the present claimed invention based on the teachings of U.S. Patent 5,294,519 to Mori or European Patent Application EP 0178864.

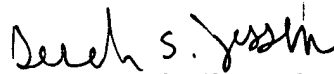
Accordingly, it is requested that the 35 U.S.C. 103(a) rejections be withdrawn.

CONCLUSION

For the reasons set forth above, Applicants' present invention, as recited in the amended claims now more clearly and particularly, is patentable. If further matters remain in connection with this case, the Examiner is invited to telephone the Applicant's undersigned representative to resolve them.

Respectfully submitted,

April 28, 2004



Derek S. Jessen
Registration No. 48,213
Paul & Paul
2900 Two Thousand Market Street
Philadelphia, PA 19103
Telephone (215) 568-4900
Fax (215) 567-5057

Order No. 2239